

**Remarks**

The following remarks are responsive to the Office Action of January 27, 2009.

At the time of the Office Action, claims 1-22 were pending. Claims 1, 4-6, 11-18, and 21-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sibbald et al. (U.S. Patent No. 7,167,567) (hereinafter “Sibbald”). Claims 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sibbald in view of Jot et al. (U.S. Patent No. 7,231,054) (hereinafter “Jot”). Claims 2-3 and 7-10, while objected to as being dependent upon a rejected base claim, would be allowable if rewritten in independent form. Applicant respectfully traverses these rejections for at least the following reasons.

Applicant notes that “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.” In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Furthermore, Applicant notes that if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

With reference to claim 1, the Examiner asserted that Sibbald discloses (Office Action, pp. 2-3)

“a method of processing sound data, wherein, before a playback of the sound by a playback device: a) signals representative of at least one sound propagating in a three-dimensional space (col. 4, lines 15-29) and arising from a source situated at a first distance from a reference point are **coded so as to obtain a representation of the sound by components expressed in a base of spherical harmonics** (col. 3, line 56 through col. 4, line 11) of origin corresponding to said reference point (claim 5), b) and a compensation of a near field effect is applied to said components by **a filtering which is dependent on a second distance** defining substantially (col. 3, line 56 through col. 4, line 11), a distance between a [playback] point and a point of auditory perception (col. 3, line 56 through col. 4, line 11)”.

Applicant respectfully disagrees with this assertion. In the passage cited by the Examiner, Sibbald teaches the use of HRTF (“Head Response Transfer Function”, see Sibbald, col. 2, lines 26-28) measurements and library. Sibbald further teaches using “an algorithm which controls the relative left-right channel amplitude difference” (Sibbald, col. 4, lines 17-19). In contrast, claim 1 recites coding signals so as to obtain a representation of the sound by components expressed in **a base of spherical harmonics**. The recitation of coding signals in

claim 1 pertains to “ambisonic encoding” as discussed in the present application, paragraph [0007] of U.S. Patent Application Publication No. 2006/0045275.

As disclosed in the present application, ambisonic encoding “consists in representing signals pertaining to one or more sound waves in a base of spherical harmonics (in spherical coordinates involving in particular an angle of elevation and an azimuthal angle, characterizing a direction of the sound . . .)” (paragraph [0007] of U.S. Patent Application Publication No. 2006/0045275) As further discussed in the present application, “[s]pherical harmonics are real functions that are bounded, as represented in FIG. 4, as a function of the order  $m$  and of the indices  $n$  and  $\sigma$ . The light and dark parts correspond respectively to the positive and negative values of the spherical harmonic functions. The higher the order  $m$ , the higher the angular frequency (and hence the discrimination between functions)” (present application, paragraph [0109] of U.S. Patent Application Publication No. 2006/0045275). The use of spherical harmonics in ambisonic encoding was further discussed in the Response to Office Action filed by Applicant on October 17, 2008.

Sibbald’s teaching of the use of HRTF measurements and library in the passages cited by the Examiner does not teach or suggest ambisonic encoding, nor any other coding of signals. Applicant respectfully submits that Sibbald does not teach or suggest coding a signal representative of at least one sound propagating in a three-dimensional space and arising from a source situated at a first distance from a reference point so as to obtain a representation of the sound by components expressed in **a base of spherical harmonics** of origin corresponding to said reference point.

Furthermore, Applicant respectfully submits that Sibbald does not teach or suggest that “a compensation of a near field effect is applied to said components by **a filtering which is dependent on a second distance** defining substantially . . . a distance between a playback point and a point of auditory perception” as recited in claim 1. The filtering taught by Sibbald involves the application of the disclosed HRTF data “in the form of FIR filter coefficients suitable for controlling a pair of FIR filters” (Sibbald, column 10, lines 44-46). Applicant respectfully submits that Sibbald does not teach or suggest compensation of a near field effect applied to **said components (i.e., components expressed in a base of spherical harmonics)** as recited in claim 1, at least because Sibbald does not teach or suggest expressing the components in a base of spherical harmonics as discussed previously.

Applicant also notes that the filtering disclosed by Sibbald is dependent on “(a) required proximity, and (b) spatial position” (Sibbald, col. 4, lines 19-20), as opposed to “a distance between a playback point and a point of auditory perception” as recited in claim 1. Applicant respectfully submits that Sibbald’s required proximity and spatial position are indicative of the spatial relationship between the **apparent sound source** and the listener’s head, whereas claim 1 recites a distance between a **playback point** (i.e., loudspeaker) and a point of auditory perception (e.g., the listener’s head). Applicant also refers the Examiner to FIG. 7 of the present application, where  $\rho$  represents the first distance as recited in claim 1, and the  $R$  represents the second distance as recited in claim 1. Thus, the filtering disclosed by Sibbald is distinct from and not suggestive of the filtering recited in claim 1.

The Examiner admitted that Sibbald “fails to disclose using a playback device,” yet asserted that “[i]t would have been obvious to use a playback device while processing the sound data since a playback device is commonly used to test processed sounds” (Office Action, p. 3). Applicant contends that the Examiner’s argument with respect to the playback device is moot, since it does not overcome Sibbald’s deficiency with respect to the remainder of claim 1. Applicant reminds the Examiner that “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.” In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Since Sibbald does not teach or suggest all the elements of claim 1, and the Examiner has not presented a convincing line of reasoning to establish a *prima facie* case of obviousness, Applicant respectfully submits that Sibbald does not teach or suggest claim 1 as asserted by the Examiner. The Examiner’s rejection of claim 1 is thus overcome, and Applicant respectfully requests that the rejection of claim 1 be withdrawn and that claim 1 be allowed.

Claims 2-20 depend from claim 1. For at least the same reasons as those provided for claim 1, the rejections of dependent claims 2-20 are overcome. Applicant respectfully requests that the rejections of claims 2-20 be withdrawn and that claims 2-20 be allowed.

Independent claim 21 includes similar features as discussed above with regard to independent claim 1. Accordingly, Applicant respectfully submits that similar arguments as those presented above with respect to claim 1 also apply to claim 21. Thus, for at least the same reasons as those provided for claim 1, the Examiner’s rejection of claim 21 is overcome. Applicant respectfully requests that the rejection of claim 21 be withdrawn and that claim 21 be allowed.

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Claim 22 depends from claim 21. For at least the same reasons as those provided for claim 21, the rejection of dependent claim 22 is overcome. Applicant respectfully requests that the rejection of claim 22 be withdrawn and that claim 22 be allowed.

Applicant thanks the Examiner for the indication that claims 2-3 and 7-10, while objected to as being dependent upon a rejected base claim, would be allowable if rewritten in independent form. However, Applicant notes that these dependent claims are also allowable at least because of their dependence from independent claim 1, as discussed previously. Accordingly, withdrawal of the objection to claims 2-3 and 7-10 is respectfully requested.

### **Conclusion**

In view of the foregoing, Applicant submits that Sibbald does not disclose the claimed invention and that the pending claims are new and non-obvious over Sibbald and general knowledge in the field. Applicant submits that all pending claims are in condition for allowance, and respectfully requests reconsideration and timely allowance of the pending claims. The Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call Applicant's undersigned representative.

Respectfully submitted,  
/brian c. rupp/

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Date: April 21, 2009

CH01/25325618.1